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# APPENDICES

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## OIL AND GAS RD&D PROGRAMS

*Photo courtesy of Hughes Christensen*

## Acronyms & Abbreviations

**AEO 99** – *Annual Energy Outlook 1999*

**AGI** – American Geological Institute

**ANL** – Argonne National Laboratory

**ANS** – Alaska's North Slope

**AOR** – Area of Review

**APEC** – Asia Pacific Economic Cooperation

**API** – American Petroleum Institute

**APT** – Applied Production Technology

**ARCO** – Atlantic Richfield Co.

**Bbls** – Barrels

**Bcf** – Billion Cubic Feet

**BHA** – Bottom Hole Assembly

**BLM** – Bureau of Land Management

**BNL** – Brookhaven National Laboratory

**BOAST** – Black Oil Applied Simulation Tool

**Btu** – British Thermal Unit

**CO<sub>2</sub>** – Carbon Dioxide

**CARB** – California Air Resources Board

**CGT** – Columbia Gas Transmission

**CNES** – Comprehensive National Energy Strategy

**CRADA** – Cooperative Research and Development Agreement

**DEA** – Drilling Engineering Association

**DOE** – U. S. Department of Energy

**DOI** – U. S. Department of the Interior

**DOT** – U. S. Department of Transportation

**DOWS** – Downhole Oil/Water Separator

**E&P** – Exploration and Production

**ECT** – Education/Communication/Training

**EE** – DOE Office of Energy Efficiency and Renewable Energy

**EIA** – Energy Information Administration

**EM** – Electromagnetic

**EOB** – Extreme Overbalanced

**EOR** – Enhanced Oil Recovery

**EPA** – U. S. Environmental Protection Agency

**FE** – DOE Office of Fossil Energy

**FERC** – Federal Energy Regulatory Commission

**FETC** – Federal Energy Technology Center

**FTAA** – Funds Transfer Agency Agreement

**GHASTLI** – Gas Hydrate and Sediments Testing Laboratory Instrument

**GIS** – Geographic Information System

**GISB** – Gas Industry Standards Board

<b>GLCC</b> – Gas Liquid Cylindrical Cyclone	<b>LBNL</b> – Lawrence Berkeley National Laboratory
<b>GRI</b> – Gas Research Institute	<b>LDCs</b> – Local Distribution Companies
<b>GSAM</b> – Gas System Analysis Model	<b>LLNL</b> – Lawrence Livermore National Laboratory
<b>GSC</b> – Geological Survey of Canada	<b>LNG</b> – Liquefied Natural Gas
<b>GTI</b> – Gas Technology Information, Inc.	<b>LRC</b> – Lined Rock Caverns
<b>GTL</b> – Gas-to-Liquids	<b>Mcf</b> – Thousand Cubic Feet
<b>GU</b> – Gas Upgrading	<b>MEI</b> – Maurer Engineering, Inc.
<b>HADOE</b> – Hispanic Association of the Department of Energy	<b>MEOR</b> – Microbial Enhanced Oil Recovery
<b>HBCU</b> – Historically Black Colleges and Universities	<b>MMcf</b> – Million Cubic Feet
<b>HQ</b> – Headquarters	<b>MMS</b> – Minerals Management Service
<b>ICGTI</b> – International Centre for Gas Technology Information	<b>MWD</b> – Measurement-While-Drilling
<b>ICHOTS</b> – International Center for Heavy Oil and Tar Sands	<b>NADET</b> – National Advanced Drilling & Excavation Technologies
<b>IEA</b> – International Energy Agency	<b>NGA</b> – Natural Gas Act of 1938
<b>IGT</b> – Institute of Gas Technology	<b>NGOs</b> – Non-Governmental Organizations
<b>INEEL</b> – Idaho National Engineering and Environmental Laboratory	<b>NIPER</b> – National Institute for Petroleum and Energy Research
<b>IOGCC</b> – Interstate Oil and Gas Compact Commission	<b>NIPSCO</b> – Northern Indiana Public Service Company
<b>IOR</b> – Improved Oil Recovery	<b>NORM</b> – Naturally Occurring Radioactive Material
<b>IPAA</b> – Independent Petroleum Association of America	<b>NPC</b> – National Petroleum Council
<b>JNOC</b> – Japan National Oil Co.	<b>NPDES</b> – National Pollutant Discharge Elimination System
<b>kW</b> – kilowatt	<b>NPTO</b> – National Petroleum Technology Office
<b>km</b> – kilometer	<b>NRC</b> – National Research Council
<b>LANL</b> – Los Alamos National Laboratory	<b>OMIs</b> – Other Minority Institutions

## Acronyms & Abbreviations (Continued)

**ONGPT** – Office of Natural Gas & Petroleum Technology

**OOIP** – Original Oil in Place

**OPRA** – Oil Program Resource Assessment

**ORNL** – Oak Ridge National Laboratory

**OSAM** – Oil Supply Analysis Model

**PCAST** – President's Committee of Advisors on Science and Technology

**PCD** – Polycrystalline Diamond Bits

**PERF** – Petroleum Environmental Research Forum

**PM** – Particulate Matter

**PNL** – Pacific Northwest Laboratory

**psi** – per square inch

**PTTC** – Petroleum Technology Transfer Council

**Quad** – Quadrillion Btu

**RBDMS** – Risk-Based Data Management System

**RCRA** – Resource Conservation and Recovery Act

**R&D** – Research and Development

**RD&D** – Research, Development, and Deployment

**RMC** – Refrigerated Mined Cavern Storage

**SEMP** – Safety and Environmental Management Planning

**SNL** – Sandia National Laboratories

**SwRI** – Southwestern Research Institute

**TAGD** – Thermally Assisted Gravity Drainage

**TASHER** – Thermoacoustic Sterling Hybrid Engine Refrigerator

**Tcf** – Trillion Cubic Feet

**TII** – Technology International, Inc.

**TORIS** – Total Oil Recovery Information System

**TRI** – Toxics Release Inventory

**TSP/PCD** – Thermally Stable Polycrystalline Drill Bit

**UBD** – Underbalanced Drilling Systems

**UNITAR** – United Nations Institute for Training and Research

**USAID** – U.S. Agency for International Development

**USGS** – United States Geological Survey

**WMBEs** – Women and Minority-Owned Business Enterprises

**WSPA** – Western States Petroleum Association

## U.S. Department of Energy Oil and Gas RD&D Program Offices

**Office of Fossil Energy (FE), DOE Headquarters, Washington, DC:** Fossil Energy's mission is to foster advanced, more efficient, and cleaner fossil energy technologies through RD&D programs. Fossil Energy is made up of the following offices: Natural Gas and Petroleum Technology, Coal and Power Systems, Strategic Petroleum Reserve, Naval Petroleum and Oil Shale Reserves, and the Federal Energy Technology Center (FETC). In the area of oil and gas RD&D, the overall program goals are to:

- (1) reduce the vulnerability of the U.S. economy to disruptions in oil supply by stabilizing domestic oil production;
- (2) increase domestic energy production in an environmentally responsible manner by increasing domestic gas production, and recovering oil with less environmental impact;
- (3) ensure energy system reliability, flexibility, and emergency response capability of oil and gas transportation and storage systems; and
- (4) develop technologies that expand long-term energy options.

**Office of Natural Gas and Petroleum Technology (ONGPT), DOE Headquarters, Washington, DC:** Responsible for directing DOE programs to develop improved technologies to find, extract, and process natural gas and crude oil, with an emphasis on improving domestic production from difficult geologic formations. Develops new and more cost-effective environmental compliance methods and technologies for oil and natural gas operations. As part of ONGPT, the Natural Gas and Petroleum Import and Export Activities Office is responsible for regulating natural gas imports and exports, maintaining statistics on North American natural gas trade, and overseeing FE's international programs pertaining to natural gas and petroleum. This office identifies export and international business opportunities for U.S. private industry, and develops programs and implements policies that will enhance the U.S. energy industry's ability to compete in overseas markets. Oil supply technology and oil and gas environmental research and development programs are implemented by ONGPT's National Petroleum Technology Office (NPTO). Natural gas supply, storage, and processing related programs are implemented by FE's FETC.

**National Petroleum Technology Office, Tulsa, Oklahoma:** Responsible for implementing the national oil supply technology and oil and gas environmental research and development programs. NPTO conducts research to quickly apply new and existing technologies to increase oil recovery; performs field demonstrations of advanced oil recovery technologies to extend the economic life of domestic fields; and conducts research to help operators reduce their environmental compliance costs and promote sound Federal and State regulatory decisions.

**The Federal Energy Technology Center, Morgantown, WV, and Pittsburgh, PA:** FETC, a Fossil Energy field organization, implements a broad range of energy and environmental programs. Hands-on research is conducted at both FETC sites in state-of-the-art research laboratories that include bench- and pilot-scale facilities. RD&D activities related to natural gas supply are coordinated with ONGPT and focus on advanced drilling, completion, and stimulation technologies; advanced imaging and diagnostics systems; secondary gas recovery; gas storage; advanced gas conversion and upgrading technologies; and gas modeling and analyses.

## Internet Sites for Oil and Gas Program Information

### NATURAL GAS AND OIL TECHNOLOGY PARTNERSHIP, ALBUQUERQUE, NM

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Description of collaborative research activities of National Laboratories with industry to transfer advanced technologies for application to oil and gas exploration, production, processing, and environmental protection.  
<http://www.sandia.gov/ngotp/>

### U.S. DEPARTMENT OF ENERGY, WASHINGTON, DC

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Information about DOE programs, science education, recent DOE news. Links to related government offices and all National Laboratories.  
<http://www.doe.gov>

### OFFICE OF FOSSIL ENERGY, WASHINGTON, DC

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Fossil energy-related DOE activities, including news, technology information, publications, speeches, events, issues, international activities, and oil and gas programs and projects, with links to Fossil Energy's Strategic Petroleum Reserve, and Naval Petroleum and Oil Shale Reserves Internet sites.  
<http://www.fe.doe.gov>

### ENERGY INFORMATION ADMINISTRATION, WASHINGTON, DC

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Extensive archive of historical data, as well as current facts and figures on energy resources and trends in the energy industry. EIA publications can be downloaded from the Internet.  
<http://www.eia.doe.gov>

### NATIONAL PETROLEUM TECHNOLOGY OFFICE, TULSA, OK

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Oil technology program news, calendar of workshops, and resources for companies, including valuable software to download. Information on oil and gas technologies and programs, environmental compliance, program success stories, and other energy links.  
<http://www.npto.doe.gov>

### PETROLEUM TECHNOLOGY TRANSFER COUNCIL, WASHINGTON, DC

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National technology clearinghouse for oil and gas producers, offering technology information, problem solving, software, workshops, and resources for industry, especially small independent operators.  
<http://www.pttc.org>

### FEDERAL ENERGY TECHNOLOGY CENTER, MORGANTOWN, WV; AND PITTSBURGH, PA

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Gas technology program and RD&D project fact sheets, electronic business center for procurements, on-line publications, as well as a "cool science" educational page for students.  
<http://www.fetec.doe.gov>